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AN INTRODUCTION TO TRACEABILITY: FRESH PRODUCE

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Disclaimer

While every possible effort has been made to ensure that the information in this manual is correct, Etrace disclaims all liability for any errors or omissions in this document. We do not claim that companies, which implement the best practices described here, will *de facto* achieve compliance with the Council Regulation (EC) No. 178/2002 concerning General Food Law. Companies or organisations using this document are advised to seek professional advice addressing their possible specific requirements.

1.0 About Etrace

The Egyptian Traceability Center for Agro-Industrial Exports (Etrace) exists to increase the competitiveness, exports, product quality & safety of Egyptian food products through the application of traceability. Toward this end, the Egyptian Ministry of Foreign Trade and Industry in cooperation with the United Nations Industrial Development Organization (UNIDO), began in Egypt the first and only multi-faceted project in the Middle East that assists fresh produce exporters, NGO's, farm associations and public institutions in their efforts to ensure high quality, safety and traceability of fresh produce. This assistance extends also to complying with international regulations on food safety including the so called "General Food Law," EC No. 178/2002.

Since July of 2004, Etrace has provided technical and financial assistance to farms, exporters, dealers, traders and other operators in the fresh produce industry in their efforts to comply with the requirements set by the importing countries.

Part of this technical assistance involved providing these companies with this traceability manual, the first version of which was published in January 2005. Throughout that year, Etrace conducted many field visits and meetings among client companies to explain the manual and to share practical experience in implementing traceability. The experiences gained and the lessons learned led Etrace to publish a second and this third version of the manual, taking applicants further into the practical implementation of traceability, providing users with a checklist for auditing their systems, as well as a decision tree for assuring the traceability systems are accurate.

2.0 Introduction

2.1 Scope

This manual presents the fundamentals of traceability and how to apply these fundamentals to the fresh produce business. Regulations and current scientific & trade literature on traceability generally do not specify sector-specific methods of implementing traceability since it is usually not their objective. This manual presents not only the theory of traceability but also a model for a traceability system that may be followed by anyone in the fresh produce business. This model complies with both E.U. requirements and suggestions. After studying this manual, the reader should be able to grasp the meaning of traceability as it applies to fresh produce, to have a working knowledge of E.U. regulations on the subject, and to be familiar with a working model for a traceability system which may be applied, perhaps in an amended form, to any pack house processing fresh produce. Finally, sections of this manual are cross-referenced with relevant entries from the international standard on traceability: ISO22005, First Edition, 2007.

2.2 Target Beneficiaries

This manual is intended for anyone with a technical or business interest in fresh produce. This group includes growers, pack house owners & managers as well as anyone associated with the distribution, storage, transportation and export of fresh produce.

2.3 Objectives

This manual is intended to accomplish the following objectives:

1. To acquaint the reader with the fundamental concepts of traceability and their implications to the fresh produce business
2. To explain E.U. regulations for traceability
3. To provide a model of what data are necessary for traceability and how these data should be linked through the supply chain
4. To demonstrate how actual data forms might be used to establish traceability in a pack house

2.4 Organization

The technical parts of this manual begin with a glossary of terms and a descriptive definition of what is traceability. Following is a summary of E.U. Legislation on traceability, a discussion of the benefits of traceability, and then a description of the technological needs of traceability systems. Following is a description of how data should be linked (Linkage of Information) through the supply chain and a model of what data should be kept and what data should be shared with your trading partners. Complementing this description is a set of forms that can be the basis for a traceability system for a pack house. Finally, this manual introduces techniques of beginning and assessing your traceability system: a brief step-wise approach for the development of a traceability system, followed by a summary of techniques used in management control of the traceability system for effective and sustainable traceability, an outline of procedures for verification of the traceability system, a traceability decision tree and a method of verification of the traceability system.

2.5 How to Use this Manual

This manual is intended to be self-instructive, with trainer-guides available at ETRACE.

1. Decide what products and ingredients you want to include in the traceability system.
2. Draw a flowchart of each chosen process, identifying each of the documents/records/sheets currently used in each step.
3. Work through the exercises in this manual, keeping in mind their applicability to your own process.
4. Once you have done the exercises, compare the worksheets at the end of this manual with your company's existing sheets. Make a list of any discrepancies.
5. Use the Traceability Decision Tree to resolve the discrepancies, if any.

Use the audit checklist (see Verification of the Traceability System) both now and after any changes in your traceability system to see how well the system is working, and if it is improving. The check list can also identify areas for improvement.

Other than the links given in the footnotes and in Suggestions for Further Reading, there are no specific electronic exercises given in this manual.

3.0 Glossary of Terms

Common Carrier: The entity, usually a third party responsible for delivery of finished product.

ISO: International Organization for Standardization

Input Shipment Identifier: A document created by a party receiving a shipment. It describes and uniquely identifies the shipment. It may include information found on the purchase order, bill of lading or invoice. It does include the date of shipment from the supplier and the date of its receipt. It also links the sender's **Output Lot Number** with the receiver's **Input Lot Number**. A single **Input Shipment Identifier** can include more than a single lot number.

Lot: A set of units of a product which has been produced and/or manufactured and/or packaged under similar conditions.

Lot Number: A unique identifying number or code, usually assigned by the entity creating the goods, to represent a group of inputs, products or outputs. Terms such as **Batch Number**, **Batch Code** and **Production Code** may all be synonymous with **Lot Number**. The **Lot Number** should include the following information: **Grower Code/Plot Number/Harvest Date**. This **Lot Number** must appear on all documentation relating to any process to which the produce may be subjected. A **Lot Number** may refer either to materials coming into a facility (**Input Lot Number**) or materials leaving a facility (**Output Lot Number**).¹

Output Shipment Identifier: A document created by a party sending a shipment. It describes and uniquely identifies the shipment. It may include information found on the purchase order, bill of lading or invoice. It does include the date of shipment and may include the supplier's **Output Lot Number**. A single **Output Shipment Identifier** can include more than a single lot number.

One up/one down: A description of the depth of a traceability system. In a one up/one down system, each participant in the food supply chain is responsible for maintaining records about the products they receive, their use (i.e. the link between inputs and outputs) and where they were shipped to, or sold. Figure 1 (page 19, below), is a graphic representation of the basic components of a one up/one down system including internal traceability.

Primary producer: A farmer or grower.

Processor: A member of the supply chain that typically receives input from a **Primary Producer** or **Common Carrier** and transforms that product into some other form. Some examples operations resulting in such transformations are sorting, washing, cooling, grading, and packaging. A supply chain may have more than one **Processor**.

SME's: Small and medium enterprises

Wholesaler/Distributor: A member of the supply chain that provides finished product to the retailer. The retailer then distributes to each individual store.

Retail/Store/Foodservice operator: The entity that has the relationship with the ultimate consumer. The foodservice operator may be an individual restaurant or an institution, such as a school, prison, hospital or hotel chain.

¹ If a facility receives some material from a supplier under that supplier's Output Lot Number, the facility may assign its own Input Lot Number to the same material. These two numbers should be linked through documentation.

4.0 What is Traceability?

The objective of this section is to define traceability, its components, its characteristics, its basic elements, its scope and its rationale. This section is short but rather theoretical. Keep in mind that traceability is a simple concept, one that you most likely already understand to some degree.

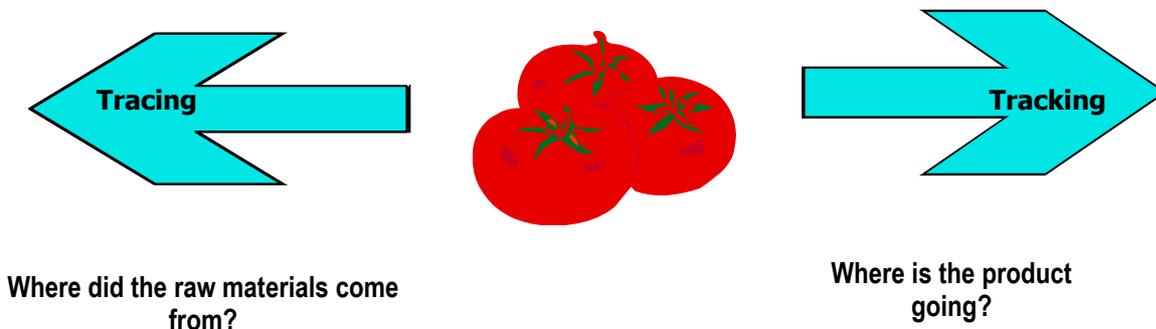
According to European Council regulation (EC) 178/220, "traceability" means:

...the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution

In commercial practice, traceability includes details of what has happened to the food (its processing history) as well as the source of the raw materials and the recipient of the finished product.

Traceability has two components:

- **Tracking:** The ability to follow the path of a specified unit and/or lot of trade items downstream through the supply chain as it moves between trading partners. Units are tracked routinely for availability, inventory management and logistical purposes.
- **Tracing:** The ability to identify the origin of a particular unit located within the supply chain by reference to records held upstream in the supply chain. Units are traced for purposes such as recall and complaints.²



Traceability systems should be able to provide the following:

- The identity of units or batches of all raw materials supplied
- Information on how, when and where they were moved or transformed³

² Canadian Food Traceability Data Standard, version 2.0 (2006); Note: GS1 Canada is the industry custodian of the Can-Trace standard.

<http://www.can-trace.org/portals/0/docs/CFTDS%20version%202.0%20FINAL.pdf>

³ Since traceability systems should operate in "real time," they should be able to reveal the history of any component in a process at any point in time. Depending on the extent of the traceability system, it can not only reveal which lots of product were manufactured from which lots of raw materials, but it can also reveal the source and causes of out-of-specification product.

- The identity of units or batches of all products manufactured and to whom these are supplied
- A documentation and record keeping system linking these data.

Traceability depends on four basic elements of identification: product, party, location and time. Tracking and tracing an agricultural commodity through the entire supply chain requires a unique identifier assigning these four elements. This unique identifier may change as the product moves through the value chain or is otherwise altered by processing. One way of assigning a unique identifier is through the use of **Lot** (or batch) **Numbers**.

In a one up/one down model of traceability, no single member of the supply chain holds all the information. Each member gathers (or collects) and keeps information about production inputs from its suppliers and keeps and shares information regarding production outputs with the next member down the chain.

The complexity of any traceability system will depend on several factors. Although the one up/one down model complies with European Council regulation (EC) 178/220, individual customers may demand more. Additionally, the characteristics of a traceability system may be driven by characteristics of the raw materials and products. For example, raw materials and products that are more susceptible to pathogens, prone to chemical contamination or intended for at-risk consumers such as children may have traceability systems that are more complex. Also, a company that makes several products may wish to give priority in traceability to those products with the greatest sales volume.

Ultimately, the complexity and even the very existence of a traceability system will depend on a cost/benefit analysis on the basis of real and perceived advantages, outlined below in Section 6.0 What Are the Benefits of Traceability?

Collecting information from suppliers and sharing information with the next trading partner ensures a mechanism for linking all the information throughout the value chain. Failure to collect, keep or share data by a single member of the chain will result in the loss of traceability.⁴

Exercise: It may be instructional to read the European Council regulation (EC) 178/220 for yourself before proceeding to the next section:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002R0178:EN:HTML>

See that the requirement on each individual in the supply chain is one up/one down and how this basic requirement may be in conflict with its own definition of traceability.

⁴ Some companies buy raw materials from dealers. Most dealers do not keep records for traceability and it is clear that traceability is usually broken at the dealer level. If this situation is not acceptable to your customers, then you may have to guarantee the hygienic quality of the various lots provided by the dealers by appropriately testing them yourself. In this way, you become the first link in the traceability chain. If the lots of produce are too small for cost-effective testing, then perhaps you should cultivate larger dealers or consider not exporting that commodity altogether.

Summary

- Traceability includes details of the source(s) of raw materials, and the recipient(s) of finished products as well as what has happened to the product in your factory.
- Traceability has two components: tracking and tracing.
- The characteristics of traceability systems:
 - Identification of all raw materials
 - Information on what happened to them in your factory
 - Identification of all finished products and to whom these are sent
 - A record keeping system linking the above data to each other
- Traceability has four basic elements of identification: product, party, location and time.

5.0 E.U. Legislation on Traceability

This section will summarize two E.U. regulations, the “General Food Law,” and a regulation intended to extend this law to food-contact surfaces such as packaging materials.

5.1 **REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.**

This regulation is referred to as the "General Food Law" and went into force on 1-January-2005. The requirements apply to all food businesses.

"Food" (or "foodstuff") means any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans. It includes drink, chewing gum and any substance, including water, intentionally incorporated into the food during its manufacture, preparation or treatment. "Food" shall not include:

- (a) feed;
- (b) live animals unless they are prepared for placing on the market for human consumption;
- (c) plants prior to harvesting;
- (d) medicinal products within the meaning of Council Directives 65/65/EEC(21) and 92/73/EEC(22);
- (e) cosmetics within the meaning of Council Directive 76/768/EEC(23);
- (f) tobacco and tobacco products within the meaning of Council Directive 89/622/EEC(24);
- (g) narcotic or psychotropic substances within the meaning of the United Nations Single Convention on Narcotic Drugs, 1961, and the United Nations Convention on Psychotropic Substances, 1971;
- (h) residues and contaminants.

Food businesses must record:

- The name and address of suppliers of food to the food business
 - The details of the products supplied by them⁵
- The name and address of business customers supplied with food
 - The details of products supplied to them
- The dates of transactions/delivery

Additional information recommended to be kept:

- Volume or quantity of foods supplied

⁵The term “supplied” should not be interpreted as the mere physical delivery of ingredients (e.g. truck driver who is an employer for a certain operator). Identifying only the name of the person physically delivering the ingredients would not be sufficient to maintain traceability along the food chain.

- Batch number
- More detailed descriptors of the product
- Internal traceability information.

This traceability information must be stored and made available to an official agency on demand.

The details of the ultimate consumer do not need to be recorded.

The requirements are of a general nature and are applicable to all food business operators in the food chain.

Other more detailed traceability requirements exist and are set out in regulations specific to some products or sectors (e.g. beef labeling requirements, GMO Regulations) which may also be applicable.

Traceability should be established for food and “*any other substance intended to be, or expected to be, incorporated into a food,*” including:

All ingredients used in the preparation, manufacture or treatment of a food, including grain, gases, water or any other substance to be incorporated into a final product

Veterinary drugs, plant protection products and fertilizers are not included in the scope, though other controls may apply under separate legislation relating to the traceability of such compounds.

There are no exceptions from the requirements for small businesses. The information required to comply with the regulation is minimal and all operators should be able to comply.

Generally, records should be kept for the period of the product’s shelf-life plus six months. For products with no specified durability date (such as fresh fruit and vegetables), records should be kept for a period of six months after date of manufacture or delivery. The format for the records will be decided by the food business operator, with consideration to ease of retrieval.

The traceability provisions of the General Food Law do not have an extra-territorial effect outside the EU. This requirement only covers all stages of production, processing and distribution in the EU from the importer up to the retail level. Article 11 of Regulation 178/2002 refers to imported products, but this should not be construed as extending the traceability requirement to food/feed business operators in third countries. It requires that food/feed imported into the Community complies with the relevant requirements of EU food/feed law.

It is common practice among some EU food business operators to request trading partners to meet the traceability requirements which go beyond the “one step back-one step forward” principle. It should be noted that such requests are part of food business’ contractual arrangements and not of requirements established by the regulation.

5.2 REGULATION (EC) No 1935/2004 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 October 2004 on materials and articles intended to come into contact with food...extends traceability requirements to packaging materials.

As its title suggests, this regulation extends the General Food Law to “articles intended to come into contact with food,” which in this context means packaging materials.

Exercise: Review Regulation (EC) No 1935/2004:

http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/l_338/l_33820041113en00040017.pdf

Come to your own conclusion if this regulation can be extended to food processing equipment (that contacts food) as well as to packaging materials.

Exercise: The E.U. regulations specify that food businesses must record “The details of the products supplied.” What do they mean by “details”?

Summary

E.U. regulations require that food businesses record:

- The name and address of suppliers of raw materials, including packaging
- The details of the products supplied
- The name and address of customers supplied with food products
- The details of products supplied to them
- The dates of transactions/delivery

6.0 What Are the Benefits of Traceability?

The purpose of this brief discussion is to outline some of the obvious and less than obvious benefits (or possible objectives) of traceability. It also aims to explain the relationship of traceability to food safety.

Traceability is a tool to help achieve broader management objectives. Management must define these objectives.

The most important objective for traceability might be to meet quality, customer, regulatory and industry standards. Failure to meet these standards can result in lower prices or even the loss of some business altogether.

The second most important objective might be to limit the scope, and therefore the cost, of a product recall by determining the origins of products.

Traceability can also help trace and assign responsibility for defective products or raw materials.

Traceability also has other roles:

- To help support product claims and provide information to customers, for example to authenticate organic, non-GMO or country-of-origin claims
- To identify and implement corrective actions to regain control of a problematic process
- To provide information for the disposition of any non-conforming product, including recall if necessary.
- To serve as a tool for process control in areas such as inventory control and quality control.
- To provide a mechanism for providing product information quickly, to regulators or customers.

Traceability assures that authorities have the ability to trace all the steps taken during the preparation and distribution of food products as well as the sources of all the ingredients. This ability is particularly useful in cases that might present health emergencies and resulting removal of certain product from trade. Traceability, therefore, assists risk management systems in that it ensures transparency, improves supply-chain management and allows smooth and cost-effective exchanges of information.

The extent of a traceability system will be a balance between costs and benefits accrued. Any traceability system and each component of that system must have a measurable economic benefit. Otherwise it will serve no purpose.

It is sometimes tempting to suggest that traceability assures food safety. Traceability can be a tool for food safety but only that. If Quality Control and HACCP systems are not adequately implemented and linked to inputs and outputs, a traceability system becomes little more than an after-the-fact trail of paper useful only in assigning blame if a problem arises. However, if hazards⁶ are monitored, recorded, controlled and LINKED to ingredients and finished products, then the traceability system can become a powerful tool for food safety.

⁶ Major hazards include aflatoxin in nuts or grain, pesticide residue in agricultural inputs or heavy metals in just about anything. Other possible hazards and concerns that could be linked to the traceability system include allergens, GMO inputs, and pathogens.

Exercise: Are there any ways, not mentioned above, that a traceability system might help your company?

Exercise: How do you view the relationship between traceability and food safety?

Exercise: The summary (below) lists seven benefits of traceability. Which ones are related to food safety, either directly or indirectly?

Summary

Traceability, can:

- Help meet regulatory and industry standards
- Help limit the scope of a product recall
- Help support product claims
- Identify and implement corrective actions
- Provide information for the disposition of any non-conforming product
- Serve as a tool for process control
- Provide a mechanism for providing product information quickly

7.0 Technology Necessary for Traceability

The tools that can be applied to traceability systems can be simple or very complex. Increasing complexity brings more options. The purpose of this brief section is to demonstrate how simple and low-technology traceability can be and to cover some of the benefits of more complex technology-based infrastructure.

All traceability systems start with hand-written records. Paper-based traceability systems are still the easiest and cheapest of all the systems. They can be based on existing management and documentation systems and are flexible in terms of the many production systems to which they can be applied. Typically, traceability systems evolve first from purely paper systems, then to converting the data to electronic form after-the-fact, then to entering data directly, and finally to a more sophisticated software system designed especially for traceability.

The adoption of various technology-based approaches to traceability can increase the following:

- Ease of data recording and retrieval, thus minimizing errors and maximizing efficiency
- Speed at which data may be collated and processed
- Number of uses for the information
- Discrimination (or precision) in product traceability, thus reducing the company's financial exposure in the event of a recall

Intangible benefits also accrue from a more technologically-based traceability system such as customer confidence, goodwill and staff morale.

The establishment of traceability can be successfully achieved using a paper-based system and these systems form the basis of many traceability systems in food business operations today. However a technology approach is increasingly being adopted to improve the efficiency and management of traceability systems. This approach, however, must be set against the capital cost of equipment and software. Although the advantages of a technology approach to traceability are minor when used in a simple production process, the benefits of using technology-based systems become more apparent where the production system becomes larger and more complex.

Exercise: Can a paper-based traceability system work at your company? At what point (from the standpoint of either volume, diversity of product line or customer requirements) do you feel that operating a paper system will no longer be desirable?

Summary

Any traceability system can operate with a clipboard, a pencil and some paper. Higher technology approaches can yield benefits but they are not necessary to achieve the fundamentals of traceability.

8.0 Linkage of Information

Since traceability requires some knowledge of your suppliers and your customers, they, likewise, must have some knowledge of you. This exchange of data from one step to another, or in this case, from supplier to customer and back, is called "linkage."

The purpose of this section is to illustrate the basic components of a traceability system, to define the concepts of Collect Data, Keep Data and Share Data, to illustrate these concepts using a model of different members in a supply chain, to introduce the concept of "internal traceability" and to demonstrate a traceability system model by means of forms which trace a product from the field to the moment of shipping.

As you work through these concepts and models, remember that there is no single "correct" method for establishing traceability. Any method is correct as long as the required information exists and is available. Exactly what information is required is a policy matter between your company, its customers and the regulators.

8.1 Basic Concepts: Collect, Keep & Share Data

Figure 1 shows the basic components of a traceability system. It shows (generally) information being exchanged by a processor and its immediate supplier (one step back) and by the same processor and its immediate customer (one step forward). To ensure the continuity of the flow of traceability information, each trading partner must pass on certain information about a shipment to the next partner in the production chain.

To ensure the continuity of the flow of traceability information, each trading partner must pass on information about the identified lot or product group to the next partner in the production chain. The sets of information necessary for traceability are called Collect Data, Keep Data and Share Data:

Collect Data: The data that the participants in the supply chain are required to obtain from the relevant member of the supply chain.

Keep Data: The information that each participant in the supply chain is required to record and maintain in their business records.

Share Data: The information that each participant in the supply chain is required to provide to the relevant member of the supply chain.⁷

The question remains: "Which data should be collected, kept and shared?" The answer depends on what is expected from the traceability system. If the objective is simply to comply with E.U. Legislation, then the information an individual supplier (such as a pack house) would be obliged to share with its customer (say a distributor) would be minimal:

- Their names and addresses
- Some details (unspecified) of the products supplied by them
- The dates of transactions/delivery

Likewise, the distributor would be obliged to share the same information about itself to the pack house and to its immediate customers. More rigorous traceability requirements will demand that more information be collected, kept and shared.

⁷ Can-Trace, see footnote 2

8.2 Methods of Linking Data

It should be emphasized again that there is no single and correct method for traceability except for those that may exist to satisfy some regulation or standard.⁸ Therefore, there is no single and correct means of linking data for traceability. One method of linking data in a traceability system is shown in the Canadian Food Traceability Data Standard, version 2.0 (2006).⁹ This standard is voluntary and suggests a model of what data should be collected, kept and shared for different industries.

A somewhat different model, for the fresh produce industry, is suggested in Figures 2-5 which covers data to be collected, kept and shared by growers, pack houses, distributors, retail establishments and common carriers. This model demonstrates one method by which data is to be collected, kept and shared in order to link data and thereby establish traceability. It should be remembered that this too is a model only and is shown here for illustrative purposes only. This model is not mandatory.

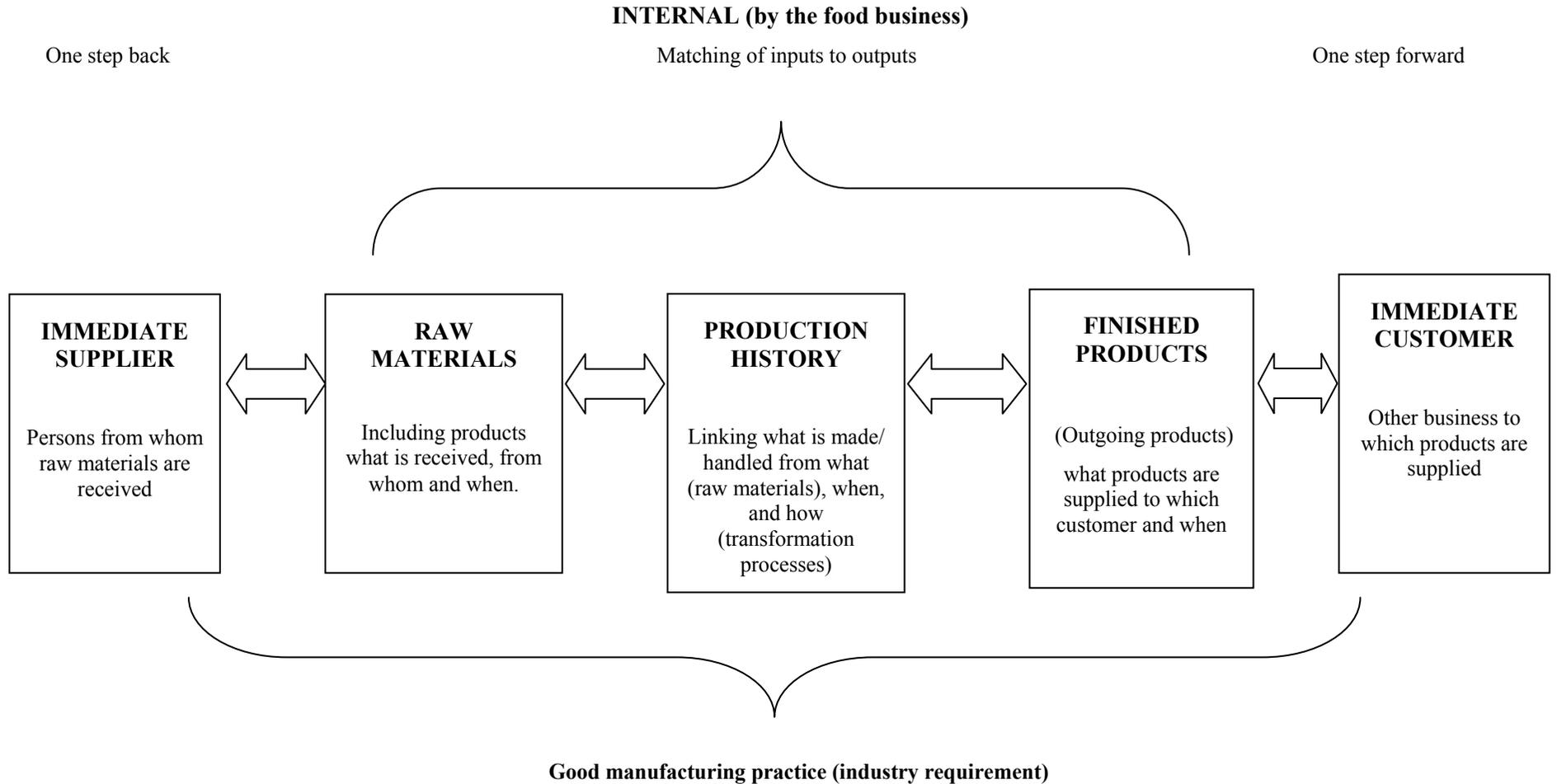
Exercises:

1. *Refer to Figure 3, Data Requirements: Processor, Shipper & Exporter, and notice the symmetry of the data collected from the suppliers with the data shared with the customers. Why does this symmetry exist?*
2. *Same question for Figure 5, Data Requirements for Common Carriers.*
3. *Why does this symmetry not exist for growers, Figure 3, or for retail establishments, Figure 4?*

⁸ Two such example are Regulation (EC) No 1830/2003 concerning the traceability and labeling of genetically modified organisms and (EC) No 1760/2000 establishing a system for the identification and registration of bovine animals and regarding the labeling of beef and beef products.

⁹ Can-Trace, see footnote 2

8.3 The Basic Components of a Traceability System: Figure 1



8.4 Data Requirements for Growers: Figure 2

Data to Collect (from Your Trading Partners)	Data to Keep (Record and Maintain) ¹⁰	Data to Share (with Your Trading Partners)
<p><u>From Your Immediate Suppliers</u></p> <p>None¹¹</p> <p><u>From Your Immediate Customers</u></p> <p>Their Identity</p> <p>Their Shipping Address</p>	<p>Product Description</p> <p>Output Lot Number¹²</p> <p>Quantity (and Units of Measure) of Each Lot</p> <p>Output Shipment Identifier</p>	<p><u>With Your Immediate Suppliers</u></p> <p>None</p> <p><u>With Your Immediate Customers</u></p> <p>Your Identity and Address</p> <p>Product Description</p> <p>Quantity (and Units of Measure) of Each Lot</p> <p>Output Shipment Identifier¹³</p>

¹⁰ The word "Keep" is somewhat misleading here since all data (from your trading partners and the data you take) should be "kept," that is, maintained at least throughout the shelf-life of the product.

¹¹ The primary producer, such as a farmer, has no previous trading partners in the same sense that a processor might have previous trading partners. However, primary producers also have raw materials in the form of seeds, fertilizers, pesticides and other chemicals which bear on traceability but are, for now, beyond the scope of this document. Until on-farm safety and quality programs are implemented, this document will rely on the identity of the farmer and the pesticide residue analysis (as part of a Quality Control program).

¹² The Output Lot Number should uniquely represent the batch and should also contain the following information: grower code, plot number and harvest date.

¹³ Remember that in this model, the Shipment Identifiers (input & output) contain both the date of shipment and the input or output lot number.

8.5 Data Requirements for Processors, Shippers & Exporters: Figure 3

Data to Collect (from Your Trading Partners)	Data to Keep (Record and Maintain) ¹⁴	Data to Share (with Your Trading Partners)
<p><u>From Your Immediate Suppliers</u></p> <p>Their Identity and Address Product Description Output Lot Number¹⁵ Quantity (and Units of Measure) of Each Lot Output Shipment Identifier</p> <p><u>From Your Immediate Customers</u></p> <p>Their Identity Their Shipping Address</p>	<p>Identity and Address of Supplier</p> <p>Product Description</p> <p>Input Lot Number Input Shipment Identifier</p> <p>Output Lot Number</p> <p>Quantity (and Units of Measure) of Each Lot¹⁶ Output Shipment Identifier</p>	<p><u>With Your Immediate Suppliers</u></p> <p>Your Identity Your Shipping Address</p> <p><u>With Your Immediate Customers</u></p> <p>Your Identity and Address Product Description Output Lot Number Quantity (and Units of Measure) of Each Lot Output Shipment Identifier</p>

¹⁴ The word "Keep" is somewhat misleading here since all data (from your trading partners and the data you take) should be "kept," that is, maintained at least throughout the shelf-life of the product.

¹⁵ Although the Output Lot Number should be included in the Output Shipping Identifier, you suppliers may not adhere to this practice. Therefore, Output Lot Number is kept as a separate item here.

¹⁶ Input and output

8.6 Data Requirements for Retailers & Foodservice Operators: Figure 4

Data to Collect (from Your Trading Partners)	Data to Keep (Record and Maintain) ¹⁷	Data to Share (with Your Trading Partners)
<p><u>From Your Immediate Suppliers</u></p> <p>Their Identity and Address</p> <p>Product Description</p> <p>Output Lot Number¹⁸</p> <p>Quantity (and Units of Measure) of Each Lot</p> <p>Output Shipment Identifier</p> <p><u>From Your Immediate Customers</u></p> <p>None</p>	<p>Identity and Address of Supplier</p> <p>Product Description</p> <p>Input Lot Number</p> <p>Input Shipment Identifier</p> <p>Output Lot Number</p> <p>Ship Date</p> <p>Quantity (and Units of Measure) of Each Lot¹⁹</p> <p>Output Shipment Identifier</p>	<p><u>With Your Immediate Suppliers</u></p> <p>Your Identity</p> <p>Your Shipping Address</p> <p><u>With Your Immediate Customers</u></p> <p>None</p>

¹⁷ The word "Keep" is somewhat misleading here since all data (from your trading partners and the data you take) should be "kept," that is, maintained at least throughout the shelf-life of the product.

¹⁸ Although the Output Lot Number should be included in the Output Shipping Identifier, you suppliers may not adhere to this practice. Therefore, Output Lot Number is kept as a separate item here.

¹⁹ Input and output

8.7 Data Requirements for Common Carrier: Figure 5

Data to Collect (from Your Trading Partners)	Data to Keep (Record and Maintain)²⁰	Data to Share (with Your Trading Partners)
<p><u>From Previous Trading Partner</u></p> <p>Shipment Identifier Product Description Quantity (and Units of Measure) of Each Lot Ship From Location Identifier Ship to Location Identifier</p>	<p>Shipment Identifier Product Description Quantity (and Units of Measure) of Each Lot Ship From Location Identifier Ship to Location Identifier</p>	<p><u>With Your Previous Trading Partner</u></p> <p>Ship Date Receive Date</p> <p><u>With Your Next Trading Partner</u></p> <p>Shipment Identifier Product Description Quantity (and Units of Measure) of Each Lot Ship From Location Identifier Ship to Location Identifier²¹</p>

²⁰ The word "Keep" is somewhat misleading here since all data (from your trading partners and the data you take) should be "kept," that is, maintained at least throughout the shelf-life of the product.

²¹ Note that in the case of a third party transporter, the data to collect, keep and share are all the same. This is because no transformation of the product is supposed to occur in transport.

8.8 Internal Traceability

Also shown in Figure 1 is a hint on the elements of "internal traceability," or tracking what happens to the product inside the processor's operation. Here, inputs are matched to outputs. This means that when 1000 kg material goes into a process, the records must be able to account for the disposition of all this material. In the case of sorting, the combined weights of all grades, plus the amount discarded, should add up to the original amount fed to the sorting process.

Consistent "internal traceability" requires records be kept wherever there is a transformation of product from one form to another. This transformation could be cooling, sorting, grading or any process (or even storage) that may change the form or condition of the product.

It is imperative to record the links between the received and the finished products and to record the links between the processed and the shipped products. Within a company, the control of all these links and accurate record keeping make it possible to connect what has been received with what has been produced and/or shipped.

8.9 Linking Data by Recording Information

Presented in this section is a model traceability system for a small pack house. Since there is no single standard method of implementing such a system, this model is only an example.

Imagine a pack house with just six operations: receipt of raw produce, cold storage/cooling, grading, packing, storage and shipment of finished produce. One example of how information might be "collected" by this pack house from its immediate supplier is shown in Appendix 1, "Example of a Picking Slip." This slip is filled out on the farm after harvest and prior to shipping the produce to the pack house. Every unit (bin, basket, barrel, etc) of produce should contain, in this model, one of these slips.

Information on the raw product received may be recorded on "Example of Pack House Reception Record," Appendix 2. This form is to be filled out on receipt of the raw produce and is at this time a "Batch Code" is assigned to the produce²².

A pallet label (Appendix 3, "Example of Pack House Raw Material Pallet Label") is normally assigned at this point since the next step is usually storage.

When raw produce is received, it may need to be pre-cooled or stored in a cooled atmosphere until further sorting and packing. Since both cooling and storage may represent (or cause) a transformation of the product, records of this process are usually kept. In this case, the added amounts and the issued amounts from the (cold) storage area are recorded. An example of a record for this step is shown on Appendix 4, "Example of Pack House Cold Storage Record Raw Material." Notice that this same form could be used for any type of storage of raw produce.

Another transformation that would require recording for internal traceability is grading (see Appendix 5, "Example of a Grading Record"). The purpose of this sheet is to record when the batch number was sorted, by whom, what weights of the various grades resulted from sorting and also to serve as an internal check that all material, including discards, was accounted for.

After sorting, it may be desirable to assign an alpha-numeric (one additional number or letter) to the batch number to indicate grade. This augmented batch code could be applied on the

²² The Batch Code (or Lot Number) should be comprised of the following information: **Grower Code/Plot Number/Harvest Date**

Batch Code Ticket (for an example, see Appendix 6) which is normally placed in each container of product ready for packing after grading/sorting. Waste or refused produce should not be issued a Batch Code Ticket.

The next logical transformation requiring record keeping is packing, Appendix 7, "Example of Packing Record." The purpose of this form is to link the Batch Codes with finished cases and pallets and for the first time to link the batch codes with the customer. In the process of packing, Case Labels (example in Appendix 8) and Finished Product Pallet Labels (example in Appendix 9) are normally created.

In the event that packed and finished produce is stored for a time, Appendix 10, "Example of Pack House Storage Record; Finished Produce" is usually required. The purpose of this form is to document which batch numbers of finished goods were stored, for how long, and if the amount "issued" (released) from storage matched the amount put in.

At the point of shipping, a shipping label for each pallet ("Example of Pallet Label/Shipping," Appendix 11) is usually created for the purpose of linking the Batch Code with the customer, date of dispatch, and the shipping company.

Exercise: Imagine you are Mr. Hesham, Manager of the Isis pack house located at Km 75 of the Alexandria Desert Road. Hyper 1 in 6th October City has ordered 1000 one-kg trays of Grade A Roma tomatoes. To fill this order you buy 2000 kg Roma tomatoes from a local grower, Misr Farms. Your Grower Code for this farm is 0001A. The 2000 kg arrive at your packing house on 2-August-2007 at 1400 hours aboard a truck with license number 3031. The picking slips indicate that the entire shipment came from a plot designated MF S4P3 and was harvested on the same day it arrived. You received 200 totes (or containers), each of 10 kg. It will be stored overnight in tempered (but not cold) storage prior to processing.

1. Using Appendix 1, show what the completed Picking Slips would look like.
2. Fill out the Pack House Reception Record (using Appendix 2) for the shipment.

Hint: Remember the batch code should contain the grower's ID, the plot number and the date of harvest. Use any format that will contain this information yet not be overly cumbersome.

3. Complete Appendix 3, Raw Produce Pallet Label, keeping in mind that this produce is as yet un-graded so its grade would be indicated as "Various." Set the time of entry at 1535 hours.
4. Record the receipt of this material in cold storage in Appendix 4. The first half of the form ("Receipts") carries much of the same information borne by the Raw Produce Pallet Label sheet. To complete the second part ("Issues"), imagine that all this produce is released from cold storage the next day (3-August) at 0715 hours and released to the Grading Department.
5. Record the performance of the Grading Department on Appendix 5: Example of a Grading Record. You will need the following data:
 - a. This being early in the morning, the first shift (#1) is working
 - b. The produce arrived at the Grading Department at 0730.

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- c. Grading yielded 1215 kg Grade A, 400 Grade B, 285 Grade C and 100 kg rejects. Remember that the order was for 1000 kg Grade A yet the process (always somewhat unpredictable) yielded more.
 - d. Grading was finished at 0845.
6. Now that the incoming lot is sorted, a new batch code can be applied since the lot is now fractionated. This new lot code is usually the old lot code followed by an alphanumeric (a single letter) to signify its grade. The new lot code is usually assigned by a Batch Code Ticket (Appendix 6). Fill this out for the Grade A material only, remembering that the date is now 3-August-2007.
7. The next step is packing (or packaging). You will need the following data to complete Appendix 7 (Example of a Packing Record):
- a. Packing started at 0930 hours.
 - b. The customer's order number is 23Z1.
 - c. Case labels and Pallet labels were "Complete."
8. Complete the Case Label, Appendix 8.
9. Complete the Pallet Label, Appendix 9. The expiry date is taken to be 21 days after the date of harvest.
10. Remember that the sorting process yielded 1215 kg but you shipped only the amount of the order, 1000 kg. The remaining 215 kg are placed in storage for finished goods (Appendix 10). Complete this form as far as you can.²³
11. You will need a Shipping Label (Appendix 11) if the shipper is a third party (or "common") carrier. Complete this form with the following additional information:
- a. The total shipment is 1000 kg and consists of five pallets.
 - b. The identity of the carrier is Abaza.

Exercise: None of Appendices 1 through 11 contain any information about food safety. Yet it would be typical for tomatoes to be measured at least for pesticide residue and perhaps for heavy metals. How would you link this safety information with the produce received and shipped?

Exercise: Same question as above only for quality characteristics such as color and size.

Exercise: If, in the model presented in Appendices 1 through 11, you received a complaint from a customer about a particular lot number of produce, how long would it take you to find out where it came from?

²³ Since you know only when this material entered storage, you can only fill out that part of the form concerning "Receipts." The part dealing with "Issues," or when the product is removed from storage can be completed only when the quantity leaves storage. It is left blank until that time.

Exercise: Would you consider the model illustrated in Appendices 1 through 11 to be a one-up one-down system? How else could you describe it?

Exercise: How does the model presented in Appendices 1 through 11 differ from the one presented in Figures 2 through 5?

Exercise: If the raw product reached you with problems resulting from poor harvesting techniques, what is your recourse? What different types of poor harvesting techniques might cause you a problem with traceability?

Exercise: Same question, but addressing problems in transportation either to the pack house or to your customer?

Exercise: The additional 215 kg product may cause a problem to the traceability system at the pack house since it is already allocated (on paper) to Hyper 1, who may not buy it. Which form would you use to correct this problem?

Summary

- “Linkage” is the exchange of data from one step to another, or from supplier to customer and back
- Any method to establish traceability is correct as long as the required information exists and is available
- It is common practice that information put into a traceability system will exceed the requirements of applicable regulations. Exactly what information goes into a traceability system is a policy matter between your company, its customers and the regulators
- The sets of information necessary for traceability is called Collect Data, Keep Data and Share Data
- “Internal traceability,” is tracking what happens to the product inside the processor's operation.

9.0 How to Proceed

1. Determine what products and ingredients you want to include in the traceability system and how this system would fit into existing quality management systems.
2. Determine the objectives, target regulatory requirements (or other standards) and company policies that are to be met by the proposed traceability system.
3. As you did at the beginning of this manual, draw a flowchart of your process, identifying each step and the documents/records/sheets currently used in each step.
4. Determine what data should be collected from your suppliers, kept by you and shared with your customers. This decision will depend on the depth (one-up, two-up) desired for your traceability system.
5. For each finished product, determine a procedure to assign a lot identifier that can be linked to lot identifiers of incoming ingredients and packaging materials.
6. Be sure that internal traceability is also considered: the finished product lot identifier should be linked to any changes that may have taken place in your factory.
7. Link any relevant food safety data to incoming materials and finished products.
8. Determine the protocol for data retrieval (where data are stored, how long they are retained, who has access to the information, etc.).
9. Assign responsibilities within the organization for the various parts of the traceability system.
10. Develop a training program for these individuals.
11. Develop a system of auditing the traceability system, recording the results and assessing corrective actions.

10.0 Management Control of the Traceability System

Any system in any company can not be sustained without commitment on the part of management in the form of necessary resources and integration of that system into the company's culture, procedures and other management systems. The purpose of this section is to illustrate some methods to integrate a sustainable traceability system into a company.

In order to assure that a traceability system is sustainable in the operation of the company, it must have the manpower and financial resources to operate and it must be linked to the company's management's policies and procedures. Part of this linkage involves documentation that assigns roles and responsibilities regarding traceability to specific departments and individuals. This documentation would include an organization chart, job descriptions and specific budget allocation for those individuals responsible for traceability.

The company should have its own Traceability Manual specific to its needs to trace hazards and to link to applicable legislation. Key personnel should have access to copies of the manual and of applicable legislation. Company procedures should call for management to review the traceability system and its underlying assumptions at a specified frequency. Those items that should be reviewed include the manual itself, specifications of raw materials & finished products, the coding systems used by your company and your suppliers, and whatever agreements that may exist between your company and your suppliers & customers insofar as they might affect traceability. Also specified for review should be a list of key auditing records, both internal and external: the procedures (scope, checklists, frequency, and corrective action) for internal auditing of the traceability system, the results of the audits themselves, including the audits of the customers and suppliers.

The company's training plan should include traceability and the training history and experience of those responsible for traceability should likewise be documented and periodically reviewed.

At the factory level, management control of the traceability system should include assuring that the process flow diagrams and traceability procedures exist, are current, approved and stored in the correct place. The next step is to assure that the procedures have been and are enacted and that the achievement of traceability follows logically from these procedures and the process flow diagram.

Factory management must also assure that the codes for raw material, work in progress and finished product exist, are in the approved format, and are all traceable throughout the process.

Exercise: How would you integrate a traceability system into the procedures of your own company?

Summary

Traceability systems, like quality systems, must be linked to corporate policies and procedures to be effective and sustainable.

11.0 Verification of the Traceability System

This section describes one method of integrating a traceability system into a company's procedures. Verification is simply another word for checking that established procedures are being followed.

On a more technical level, verification is the application of methods, procedures, tests and other evaluations, in addition to monitoring, to determine compliance with the traceability system in place.

Verification that a procedure is being followed usually involves an internal audit which is essentially a review by an individual inside your company. Internal audits may include reviewing documents, random checks and mock recalls.²⁴

One component of verification might be a periodic review of the following:

- Status, such as the results of a mock recall or the results of an audit,
- Changes in your own process, package or processing, or in those of your suppliers and/or customers,
- New developments, such as customer complaints, new regulations or new methods of evaluating data.

The frequency of verification varies by commodity, but it is recommended that fresh produce exporters make random checks daily and to conduct a mock recall once a week at minimum. Review of documents should occur at "planned intervals" to assure that the traceability system:

- a) conforms to expectations and to the food safety management system requirements established by the organization, and
- b) is effectively implemented and updated.

Internal audits conducted by a document review should, when possible, be compared to actual practice while the factory is in operation.

An audit program should be planned taking into consideration the importance of the processes and areas to be audited, as well as any procedural updates resulting from previous audits. The audit criteria, scope, frequency and methods should be well-defined. The auditors should be selected to ensure objectivity and impartiality of the audit process. Auditors should not audit their own work.

The management responsible for the area being audited should ensure that corrective actions are taken without undue delay to eliminate nonconformities and their causes. Follow-up activities should include verification of the corrective actions taken and reporting the verification results. Management should ensure that procedures to eliminate such nonconformities are established and followed. These procedures should include methods of documentation of such nonconformities and subsequent corrective action.

Additionally, management should establish key performance indicators for the traceability system in order to measure the system's effectiveness.

²⁴ A mock recall might involve randomly identifying a case or pallet or your product at a customer's warehouse and, using the information on the label, making sure that the product can be traced through your operation to the supplier.

Exercise: Given the process documented in Appendices 1-11, how would you structure a verification program:

- *Which methods would you use?*
- *At what frequency?*

Exercise: Using the Basic Traceability System Checklist, (Appendix 13), see if the process you have documented has any deficiencies.

Summary

- “Verification” means checking
- An “internal audit” means checking that is being done by an individual inside your company
- An internal audit may include reviewing documents, random checks and mock recalls
- Internal audits, when possible, should be compared to actual practice while the factory is in operation

12.0 Suggestions for Further Reading

Annotated EC Guidance on the Implementation of Articles 11, 12, 16, 17, 18,19 and 20 of Regulation (EC) N° 178/2002 on General Food Law

Conclusions of the Standing Committee on the Food Chain and Animal Health
<http://www.foodlaw.rdg.ac.uk/pdf/eu-05007-food-law-guidance.pdf>

CODEX: Principles for traceability/product tracing as a tool within a food inspection and certification system CAC/GL 60-2006

http://www.codexalimentarius.net/download/standards/10603/CXG_060e.pdf

Improving traceability in food processing and distribution Ian Smith and Anthony Furness, eds. (CRC - Mar 31, 2006)

Food Traceability Report (weekly e-newsletter):

<http://www.foodtraceabilityreport.com/home.asp>

Traceability Best Practices, Fresh Produce Industry, North America; (Canadian Produce Marketing Association/Produce Marketing Association Traceability Task Force)

http://www.pma.com/view_document.cfm?docID=50

Fresh Produce Traceability, a Guide to Implementation, Version 2

Produce Marketing Association

Canadian Produce Marketing Association, October 2006

http://www.pma.com/view_document.cfm?docID=87

Guidance Note: Regulation (EC) 178/2002 (General Food Law)

Food Safety Authority of Ireland, February 2005

http://www.fsai.ie/legislation/eu_hygiene_regs/178_2002_Guide_FSAI.pdf

Code of Practice No. 5: Food Incidents and Food Alerts

Food Safety Authority of Ireland, 2004

<http://www.fsai.ie/publications/codes/cop5.pdf>

Can-Trace Multi-Ingredient Working Group

Multi-Ingredient White Paper, March 2006

Agriculture and Agri-Food Canada

<http://www.can->

[trace.org/portals/0/docs/Multi%20Ingredient%20Final%20Report%20March%202006%20-%20mjf.pdf](http://www.can-trace.org/portals/0/docs/Multi%20Ingredient%20Final%20Report%20March%202006%20-%20mjf.pdf)

Traceability Decision Support Tool
Agriculture and Agri-Food Canada
<http://www.can-trace.org/portals/0/docs/Can-Trace%20Decision%20Support%20Template%20v1.03.xls>

Can-Trace Integration Guidelines
Final Report April 2006
Agriculture and Agri-Food Canada
<http://www.can-trace.org/portals/0/docs/Can-Trace%20Integration%20Final%20Report%20April%202006%20-%20mjf.pdf>

Can-Trace Technology Guidelines
Agriculture and Agri-Food Canada, March 2006
<http://www.can-trace.org/portals/0/docs/Can-Trace%20Technology%20Guidelines%20Mar%202006%20-%20mjf.pdf>

Report on Can-Trace National Food Traceability Consultation Sessions
Agriculture and Agri-Food Canada, June 2005
<http://www.can-trace.org/portals/0/docs/ConsultationSessionReport.pdf>

Can-Trace Produce Pilot Project Report
Agriculture and Agri-Food Canada, 2004
<http://www.can-trace.org/portals/0/docs/Can-TraceProducePilotProjectReport.pdf>

Can-Trace Decision Support System for Food Traceability
Agriculture and Agri-Food Canada, 2004
<http://www.can-trace.org/portals/0/docs/Can-TraceDecisionSupportSystemforFoodTraceability.pdf>

Report of the Can-Trace Small and Medium Enterprises (SME) Working Group
Agriculture and Agri-Food Canada, May 19, 2004
<http://www.can-trace.org/portals/0/docs/ReportoftheCan-TraceSMEWorkingGroup.pdf>

International Standard ISO22005, First Edition, 2007-05/15: Traceability in the feed and food chain-General principles and basic requirements for system design and implementation

13.0 Appendices

Appendix 1: Example of a Picking Slip

Grower Name	Product	Plot No.	Harvest Date
Grower Code	Variety		

Appendix 2: Example of Pack House Reception Record

Grower					Grower Code			
Pack House								
Manager					Date			
Receiving Time	Harvest Date	Plot Number	Truck ID	Product Description	No. Units	Unit Weight	Picking Slips	Batch Code

Appendix 3: Example of Raw Produce Pallet Label for Stored Raw Material

Product:	Variety:	Grade:
# of Units:	Unit Weight / Count :	
Received Date:	Batch Code:	
Storage entry time:		

Appendix 4: Example of Pack House Cold Storage Record for Received Raw Material

Pack House										
Manager					Date					
<i>Product Description</i>	<i>Batch Code</i>	Receipts			Issues					
		<i>Date</i>	<i>Time</i>	<i>Quantity</i>	<i>Date</i>	<i>Time</i>	<i>Quantity</i>	<i>To Department</i>	<i>Closing Balance</i>	<i>Signature</i>

Appendix 5: Example of a Grading Record

Product:				Variety :						
Customer:				Date:						
Responsible:				Shift #:						
<i>Start Time</i>	<i>Product Name</i>	<i>Batch Code</i>	<i>Weight In</i>	<i>Weight Out</i>				<i>Total Graded</i>	<i>Finish Time</i>	<i>Signature</i>
				<i>Grade A</i>	<i>Grade B</i>	<i>Grade C</i>	<i>Rejects</i>			

Appendix 6: Example of a Batch Code Ticket

Product/Grade:

Batch Code:

Date:

Appendix 7: Example of a Packing Record

Product					Package weight		Date	
Pack House/Manager								
<i>Start Time</i>	<i>Product Description</i>	<i>Batch Code</i>	<i>Customer Name</i>	<i>Customer Order No.</i>	<i>Order Quantity</i>	<i>Quantity Packed</i>	<i>Case Label</i>	<i>Pallet Label</i>

Appendix 8: Example of a Case Label

Product	Variety	Grade
No. of Units	Unit Size	
Packing Date	Batch Code	
Country of Origin		
Pack House Name		

Appendix 9: Example of a Pallet Label

Product	Variety	Grade
Case size:	No. of Cases:	
Packing Date:	Batch Code:	
Expiry Date:		
Customer/ Destination:		

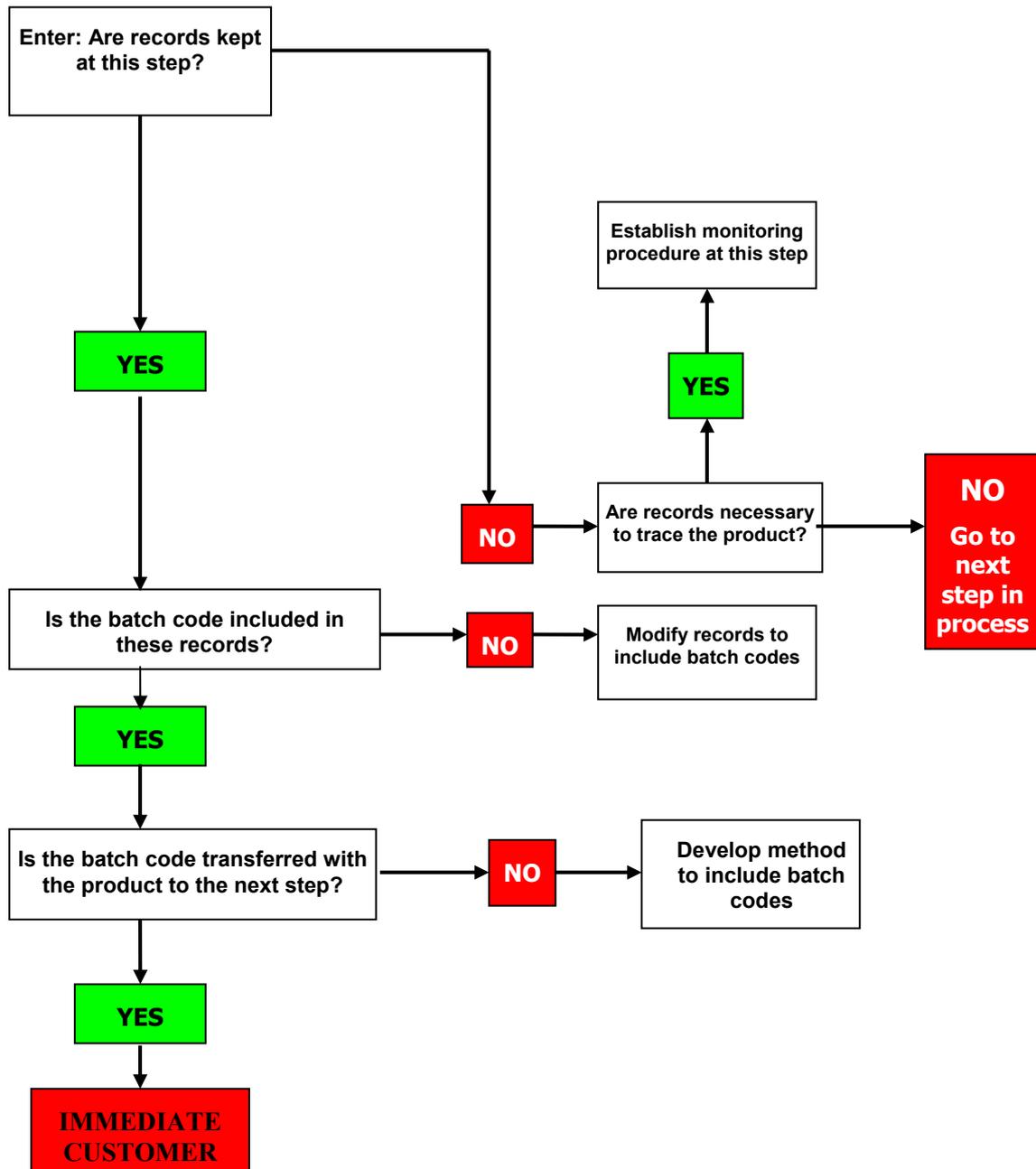
Appendix 10: Example of Pack House Storage Record for Finished Goods

Product Description:					Date:				
<i>Customer</i>	<i>Batch Code</i>	Receipts (in)			Issues (out)				
		<i>Date</i>	<i>Time</i>	<i>Quantity</i>	<i>Date</i>	<i>Time</i>	<i>Quantity</i>	<i>Balance</i>	<i>Signature</i>

Appendix 11: Example of Pallet Label/Shipping

Product Description	
Variety	Grade
Pack Size	Order Quantity/Total No. Cases Dispatched
Pack Date	No. Cases This Pallet
Dispatch Date	Batch Code
Deliver To:	
Customer Address:	
Transport Co.	
Pallet no.	of
Supplier Name/Address	
Country of Origin	

Appendix 12: Traceability Decision Tree



Appendix 13: Basic Traceability System Checklist

When auditing a facility for traceability, the following checklist is a place to start. Please note that is intended to be illustrative, not definitive or necessarily complete.

- Raw materials should have a certificate of origin:
 - All raw materials are of known origin and approved in the country of production and in the importing country
- Raw materials, work in process and finished products should have a consistent coding system
- The batch code should be known, visible and documented for all product in every step of production from entry of raw material until dispatch
- Batches or individual pallets, cases or other units should be easily traced and tracked at any given time through the established documentation and record keeping system
- Waste should be segregated, identified and isolated from products that are not waste
- Rejected product and product undergoing inspection should be segregated from approved product
- Each unit of packaged food should bear permanent and legible code marks or lot numbers. The coding system and labeling must comply with regulatory and customer requirements
- This code should identify the establishment, the day, month and year in which the food was produced
- Code marks may be “open” or “closed.” If closed, the key to understanding the code must be in the possession of factory and management personnel.

Appendix 14: Cross References to ISO22005

This appendix is intended for those with access to ISO22005, First Edition, 2007-05/15: Traceability in the feed and food chain-General principles and basic requirements for system design and implementation. Below is a table which references each section of the ISO standard with the appropriate section of this manual.

It is important not to confuse this manual with the ISO standard. That standard contains just what the title says: general principles and basic requirements. It does not tell you how to achieve these requirements since methods of implementation are driven by the needs of the commodity and in any case are determined by the individual company. This manual attempts to suggest methods and models for implementation of traceability.

Any company intending to design and implement a traceability system according to the ISO standard should look first to that standard for requirements and then to this manual for suggestions on how to implement these requirements.

ISO22005		References in This Manual
	Introduction	Various
1	Scope	2.0 Introduction
2	Normative references	None
3	Terms and definitions	3.0 Glossary of Terms
4	Principles and objectives of traceability	4.0 What is Traceability 5.0 E.U Legislation on Traceability 6.0 Benefits of Traceability
5	Design	2.0 Introduction 5.0 E.U Legislation on Traceability 6.0 Benefits of Traceability 7.0 Technology Necessary for Traceability 8.0 Linkage of Information 9.0 How to Proceed 10.0 Management Control of the Traceability System 11.0 Verification of the Traceability System
6	Implementation	9.0 How to Proceed 10.0 Management Control of

ISO22005		References in This Manual
		the Traceability System 11.0 Verification of the Traceability System
7	Internal audits	11.0 Verification of the Traceability System
8	Review	11.0 Verification of the Traceability System